

A low cost and high speed electrical capacitance tomography system design

Abstract

Electrical capacitance tomography system is a system which can be used for imaging industrial multi-component processes involving non-conducting fluids in pipelines. In order to make an ECT system applicable in all kinds of industries, the cost factor of building an ECT system is essential. In this research, we focus on reducing the cost of the system while not affecting the quality of the results. In the past, most of the researches in tomography system have concentrated more on the design of the sensor, and use DAS card as the interface to the PC. This will increase the cost of the system. In this case, the cost of the data acquisition system will be needed to be taken into consideration. To develop a low cost and fast data acquisition system, a Universal Serial Bus (USB) is found to be the most ideal technology. In order to further reduce the cost of the ECT system, a very low cost material, aluminium plates are used as the electrodes of the system. The information obtained in the PC will be reconstructed using iterative algorithm in order to obtain a precise image of the flow in the pipeline. The information obtained from the system will be useful for the purpose of controlling the flow in the pipeline.